MYCOTAXON

Volume 107, pp. 209–213 *January–March 2009*

Two new lichenicolous *Arthonia* species from Turkey

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Abstract — Two new *Arthonia* species are described from Turkey: *A. epitoninia* on the squamules of an unidentified *Toninia* sp., and *A. rinodinicola* on the areoles of *Rinodina gennarii*. Previously, no *Arthonia* species were reported from these host genera.

Key words — *Ascomycota*, lichenicolous fungi, lichens, taxonomy

Introduction

In the course of investigating the lichenicolous fungi kept at ANES (Herbarium of Anadolu University), several new species were described and many new records for Turkey published in separate publications (Candan & Halıcı 2008, Halıcı & Candan 2007, Halıcı et al. 2007a,b, 2008). Approximately 130 infrageneric taxa of lichenicolous fungi are known from Turkey (Candan & Halıcı 2008, Halıcı 2008a,b,c), and a key to the lichenicolous *Ascomycetes* including mitosporic fungi was recently published by Halıcı (2008a). Here we describe two new lichenicolous species of *Arthonia* from the ANES collections.

Material and methods

The types of the new species are deposited in ANES (Anadolu University, Department of Biology, Eskişehir). Specimens were examined with an Olympus BH-2 research microscope fitted with Nomarski differential interference contrast optics and a drawing tube. Sections were prepared by hand and examined in I (Lugol's iodine (MERCK 9261) and Meltzer's iodine, with [KI] and without [I] pre-treatment with 10% KOH), 10% KOH, and water. Ascospore measurements were taken in water; the extreme values outside the main range are given in

parentheses. The length/breadth (l/b) ratio of the ascospores is provided in the same way.

The species

Arthonia epitoninia Halici & Candan, **sp. nov.** FIGURE 1

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Fungus in thallo Toniniae sp. incolens. Apothecia nigra, 0.2–0.5 mm diam. Epithecium 10–20 µm altum, olivaceo-brunneum. Hymenium 40–50 µm altum, hyalinum. Hypothecium 15–25 µm altum, brunneum. Asci (33–)34.5–46.5(–50) × (16.5–)18–24(–27) µm, clavati-obovati, octospori. Ascosporae 1–septatae, hyalinae, halonatae, (11–)13–16 × 5–6 µm, l/b = (2.2–)2.4–2.7(–3.0).

Typus: Turkey, Ankara, Bala District, south of Beynam Village, 39°41'N, 32°55'E, alt. 1450 m, on squamules of *Toninia* sp. on soil, 2 July 2003, leg. M. Candan (ANES 11.537 – holotypus).

Etymology: The epithet "*epitoninia*" refers to the host *Toninia*.

Description: Lichenicolous, on the squamules of *Toninia* sp., causing heavy discolouration and suppressing ascomata production in the host, heavily parasitic. Ascomata apothecia, dispersed on the surface of the host squamules, black, epruinose, superficial, 0.2–0.5 mm diam, 1–4 per squamule, lacking an exciple, arthonioid. Epithecium dark brown with an olivaceous tinge, 10–20 µm tall, K+ greenish, N–; hymenium with numerous oil droplets, colourless, 40–50 µm tall, I_{Lugol}–, KI_{Lugol} –, $I_{Meltzer}$ –; hypothecium dark brown to blackish brown, 15–25 µm tall. Hamathecium of abundant, septate, branched and anastomosed paraphysoids, 2–2.5 µm wide, with markedly swollen, olivaceous brown apices, to 4–5.5 µm wide. Asci broadly clavate to obovate, short-stalked, bitunicate in structure, 8-spored, I_{Lugol}–, KI_{Lugol}–, without a KI_{Lugol}+ blue apical ring, (33–)34.5–46.5(–50) × (16.5–)18–24(–27) µm. Ascospores irregularly arranged in the asci, mostly overlapping, ellipsoid, hyaline, 1–septate, rounded to somewhat broadly pointed at the apices, slightly constricted at the septa, the upper cell slightly larger than the lower one, with one droplet per cell, surrounded by a I_{Lugol}–gelatinous sheath, (11–)13–16 × 5–6 µm (n = 36), l/b = (2.2–)2.4–2.7(–3.0), all measurements including the closely adhering sheath. Conidiomata not observed.

Ecology and distribution: Heavily parasitic on the squamules of *Toninia* sp. causing heavy discolouration and suppressing ascomata production in the host. The new species is known only from one locality in central Turkey. As the host genus has a wide distribution in the Northern Hemisphere, the species should be searched elsewhere.

Observations: *Arthonia epitoninia* is most similar to *A. almquistii* Vain., a lichenicolous species known on *Amygdalaria panaeola*, *A. pelobotryon*, *Porpidia crustulata* and *Trapelia coarctata*. However, *A. almquistii* is well distinguished

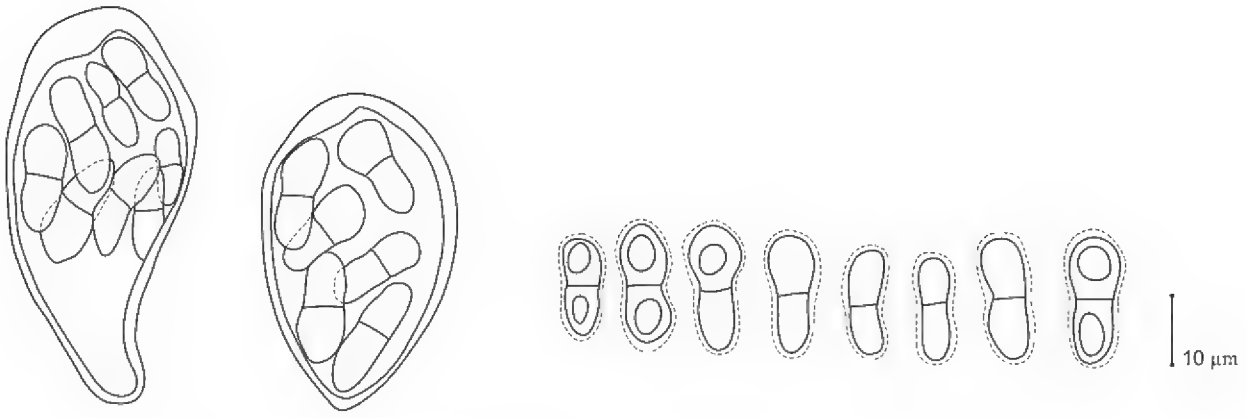

FIG. 1. ***Arthonia epitoninia*** (holotype). Asci and ascospore outlines.

from *A. epitoninia* by having mature ascospores with gelatinous sheath stained red by I_{Lugol}, and a I_{Lugol}+ red hymenium (Triebel 1989). *A. oligospora* Vězda, a lichenicolous species known on the thallus of *Aspicilia* sp. (Candan & Halıcı 2008) and on the thalli of a saxicolous, calcicolous lichen (Clauzade et al. 1989), differs from *A. epitoninia* by having constantly 4-spored asci (Clauzade et al. 1989, Candan & Halıcı 2008). *A. epimela* (Norman ex Almq.) I.M.Lamb, a lichenicolous species on *Amandinea punctata* has narrower ascospores [3.5–4.5 µm vs. 5–6 µm broad] and an I_{Lugol} + red hymenium (Almquist 1880, Clauzade et al. 1989).

Arthonia rinodinicola Candan & Halici, **sp. nov.** FIGURE 2

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Fungus in thallo Rinodinae gennarii incolens. Apothecia nigra, 0.1– 0.2 mm diam. Epithecium 10–20 µm altum, brunneum. Hymenium 35–45 µm altum, hyalinum. Hypothecium 20–30 µm altum, brunneum. Asci (24–)25–34(–35) × (17–)17.5–19(–20) µm, clavati-obovati, octospori. Ascosporae 1–septatae, hyalinae sed demum brunneum, 10–13(–14) × (4–)4.5–5.5(–6) µm, l/b = (1.8–)2.0–2.6(–2.9).

Typus: Turkey, Malatya, Arguvan, north of İçmece Village, 38°44'N, 38°25'E, alt. 871 m, on *Rinodina gennarii* on calcareous rock, 03 Aug 2004, leg. M. Candan (ANES 11.543 – holotypus).

Etymology: The epithet "*rinodinicola*" refers to the host *Rinodina*.

Description: Lichenicolous, on the areoles of *Rinodina gennarii*, not causing any evident damage, parasymbiotic. Ascomata apothecia, dispersed on the surface of the host areoles, black, epruinose, superficial, 0.1–0.2 mm diam, 1–3 per areole, lacking an exciple, arthonioid. Epithecium dark brown, 10–20 µm tall, K+ greenish, N–; hymenium colourless, 35–45 µm tall, I_{Lugol} –, KI_{Lugol}–, $I_{Meltzer}$–; hypothecium dark brown to blackish brown, 20–30 µm tall. Hamathecium of paraphysoids, abundant, septate, branched and anastomosed, 1.5–2.0 µm wide; markedly swollen apices, reddish brown, to 3.5–4.5 µm wide. Asci broadly clavate to obovate, short-stalked, bitunicate in structure,

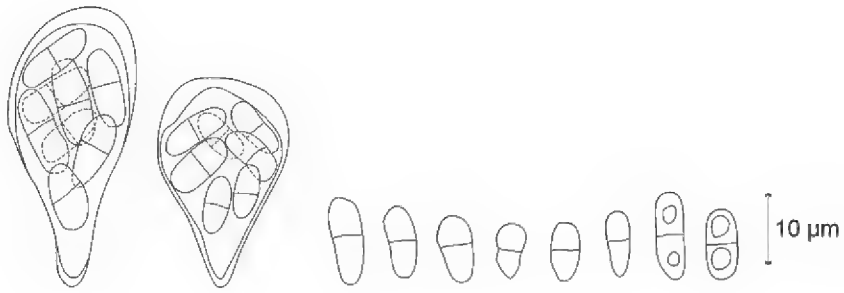

Fig. 2. ***Arthonia rinodinicola*** (holotype). Asci and ascospore outlines.

8-spored, I_{Lugol}–, KI_{Lugol}–, without a KI_{Lugol}+ blue apical ring, (24–)25–34(–35) × (17–)17.5–19(–20) µm. Ascospores irregularly arranged in the asci, mostly overlapping, ellipsoid, hyaline, soon becoming brown, 1–septate, rounded to somewhat broadly pointed at the apices, slightly constricted at the septa, the upper cell slightly larger than the lower one, with one droplet per cell in mature ascospores, without a gelatinous sheath, 10–13(–14) × (4–)4.5–5.5(–6) µm (n = 36), l/b = (1.8–)2.0–2.6(–2.9). Conidiomata not observed.

Ecology and distribution: Parasymbiotic on the areoles of *Rinodina gennarii*, not causing any evident damage to the host. The new species is known only from one locality in eastern Turkey. As the host species (sometimes considered a synonym of *Rinodina oleae*) has a wide distribution in the Northern Hemisphere, this new *Arthonia* should be searched for elsewhere.

Observations: The size, shape and colour of the ascospores of *Arthonia rinodinicola* is most similar to *A. cohabitans* Coppins, a lichenicolous species described on *Arthothelium reagens* (Coppins 1989). However, *A. cohabitans* is easily distinguished from the new species by having a K+ purple reaction of the ascomatal sections due to a yellow-orange pigment (Coppins 1989). Another lichenicolous species of *Arthonia*, *A. punctella* Nyl., has also brown ascospores when mature, but they are warted and bigger [12–17 × 5–6.5(–7.5) µm vs. 10–13(–14) × (4–)4.5–5.5(–6) µm] (Coppins 1992). The ascospore size is similar to *A. almquistii*, a lichenicolous species known on *Amygdalaria panaeola*, *A. pelobotryon*, *Porpidia crustulata* and *Trapelia coarctata*, but the ascospores are never brown in that species and the gelatinous sheath of mature ascospores is stained red by I_{Lugol} (Triebel 1989).

Acknowledgements

Paul Diederich (Luxembourg) and Brian Coppins (UK) are thanked for reviewing this paper. Gökhan Hınıslı and Okan Sezer are thanked for preparing the figures. MC also thanks his PhD supervisour, Ayşen Türk, for her help during his PhD thesis.

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